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## A Fern Collecting Trip in Cuba

E. W. GRAVES

For a number of years it had been my great desire to make a trip to the tropics, and see for myself some of the beauties of tropical verdure. Not until the fall of 1919 was this privilege given me. Two years before I had tried for a passport, but as the war was on, and as all able-bodied men were needed at home, it was refused me. But in October, 1919, I succeeded in getting Lansing's signature to the necessary papers.

Early on the morning of the 26th I left Mobile on the L. & N. for Jacksonville, Florida. All day long we traveled over the sandy stretches of the Gulf slope, now and then running through scattered pine forests. Often near streams we would see groves of live oaks festooned with Florida moss hanging from the limbs. Reaching Jacksonville about ten o'clock in the evening, and having only ten minutes to spare, I soon boarded the East Coast Line passenger which was to carry me to Key West. All night we sped on and when morning came we were well down the Florida coast nearing West Palm Beach.

At West Palm Beach along the railroad tracks I saw several ferns which apparently were *Pteridium caudatum*, *Pteris longifolia*, *Blechnum occidentale*, and *Tectaria trifoliata*. As we traveled farther south where the pines gave way to palms, the trees were often covered with epiphytic ferns. The scenery was now beautiful, orange orchards heavily laden with fruit, bordered with groves of palms. Occasionally we would get glimpses of the Atlantic on the east, but often we would travel over sandy wastes or the swampy land of the everglades.

From the mainland to Key West, a distance of 120 miles, is one of the most remarkable railroads in the

world, literally a railroad through the sea. The narrow islands are connected by concrete trestles or viaducts. At one place we traveled for miles with the sea on either side of us, appearing as though the train was running on the water. Reaching Key West about six in the evening of October the 27th, I soon took passage on the boat that plies between Key West and Havana, Cuba, and by daylight I was in sight of "the Pearl of the Antilles."

Upon arriving at Havana I took the electric car for Guanajay, then went by auto to San Claudio where my friend Mr. Cochran was to meet me. Guanajay is located 31 miles southwest of Havana, and San Claudio is 20 miles west of Guanajay. To the south and stretching one hundred miles or more to the west, lie the mountains of western Cuba. This region, which receives more rainfall than any other part of Cuba, is where most of my collecting was done. Three thousand feet is the highest altitude reached by these mountains. The highest mountains of Cuba are in the east end of the island. Lying to the west of Santiago there are several peaks whose tops tower nearly eight thousand feet.

I only collected a short time near Santiago. In fact my stay in the island was short as I could speak only a few words of the Spanish language and I was greatly handicapped without it. I tried to find a guide to go out with me, but could find no one who could speak both Spanish and English.

My friend, who could speak Spanish, could not spend as much time with me in the woods as I would have liked. Woods I said, I should have said jungle, for if one wandered off the trail he would find himself in a mass of trees and bushes of all sizes held together by vines of various kinds with ferns and orchids thrown in.

In the interests of those who might take to ornithology,

I will say that here was a paradise for birds of various colors and sizes. Here were beautiful hummers, warblers, cuckoos and a robin similar to our northern robin, *Merula migratoria*. This robin probably was *Merula nigrescens*. It had a black breast instead of red and yellow bill and legs and mimicked our northern bird as it ran about on the greensward. A large black and white cuckoo several times larger than our yellow-bill cuckoo was rarely seen but often heard. A very beautiful bird about the size of the robin was seen among the trees, having a coat of many colors, composed of bright red and green mingled with white and black. A small warbler with a coat all green and head yellow was continually hopping about in the low bushes. Our American redstart and Maryland yellowthroat seemed to be at home in the rose-wood trees and shrubbery along the trail. Many others were seen which I cannot mention here.

While on the train going from Havana to Guanajay I saw many ferns I could not make out. I did manage to recognize *Pteris longifolia* and *Acrostichum excelsum* near Arroya Arenas. Near Punta Brava I saw masses of *Anemia adiantifolia* and *Dryopteris normalis*.

San Claudio is only five miles from the Gulf and the same distance from the mountains. I found very few ferns in the town, but as I drew near the mountains there were more ferns in evidence and where the heavy forest set in they were abundant. *Anemia adiantifolia* grew like a weed by the roadside after leaving the town, but in the higher hills it was rare. Tree-ferns, which I fully expected to find plentiful, I saw only once or twice in the higher mountains of western Cuba. They were of one species, *Alsophila myosuroides*. I saw no tree-ferns at all during my short stay in eastern Cuba.

It being the fall of the year, I hardly expected to find orchids in bloom. However, I was agreeably sur-

prised, for growing on rocks and tree limbs and anywhere they could find a footing, I found *Epidendrum cochleatum* L. with waxy flowers of a purple color an inch and a half or two inches across, and with leaves two feet long. In rich woods I found *Habenaria alta* Hook. just beginning to bloom. In the high mountains near Santiago I found two orchids in bloom which Prof. Oakes Ames later reported to be *Warszewiczella discolor* (Lindl.) Reichenb. and *Pleurothallis sertularioides* (Sw.) Spreng. The latter was a tiny little plant with flowers less than a quarter of an inch across.

There seemed to be more ferns in the western part of the island than in the eastern part, as the west end seems to receive the heaviest rainfall. The jungles were more dense in the west than in the east. In the hills near San Claudio one could hardly advance through the woods at all without cutting his way with a machete.

I have presented a set of the ferns collected by me to the National Museum and a set, with a few exceptions, to the Society. Of some very scarce species I collected only a very few specimens. In the short time I was in the island I found only fifty-two species. They are listed as follows.

#### CYATHEACEAE.

*ALSOPHILA MYOSUROIDES* Liebm. I only found one large specimen of this tree-fern and one small specimen. The large one was about eight feet high and was a beautiful specimen. It grew at a high elevation south of San Claudio.

#### POLYPODIACEAE

*POLYPODIUM PHYLLITIDIS* L. A fern with long, leathery fronds one to three feet long, growing on rocks and trees. Found near San Claudio in Pinar del Rio Province, also in Oriente Province west of Santiago.

*P. PILOSELLOIDES* L. A small fern growing in masses on rocks and trees at San Claudio and Santiago.

*P. EXIGUUM* Hew. Similar to *P. piloselloides* and growing with it at San Claudio and Santiago.

*P. GLADIATUM* Kze. A pinnate fern a foot high growing in rich soil at San Claudio.

*P. ANGUSTIFOLIUM* Sw. A small fern growing in rich soil at San Claudio.

*P. PECTINATUM* L. Growing in soil on rocks at 3500 ft. altitude west of Santiago.

*P. AUREUM* L. On tree-stumps and rocks at 1500 ft. altitude near San Claudio.

*P. POLYPODIOIDES* (L.) Watt. Found growing on rocks and trees at San Claudio.

*DRYOPTERIS SCLEROPHYLLA* (Kze.) C. Chr. A large fern growing in rocky ground on shady hillsides south of San Claudio at 1000 ft. altitude.

*D. RETICULATA* (L.) Urban. A large plant growing in dense shade in ravines at San Claudio.

*D. OBLITERATA* (Sw.) C. Chr. A very large fern with deeply serrate pinnae in rich shady ravines at San Claudio.

*D. SERRA* (Sw.) Ktze. A large fern with long narrow serrate pinnae. Growing in limestone in the city of Havana.

*D. SANCTA* (Sw.) Ktze. A fern very much resembling *D. noveboracensis* of the States, found growing on damp rocks in shady ravines at San Claudio.

*D. MEGALODUS* (Schkuhr) Urban. A large fern growing high up on the mountainside at Santiago at 2500 ft. altitude.

*D. TETRAGONA* (Sw.) Urban. Growing in rich, rocky soil at San Claudio.

*D. NORMALIS* C. Chr. Growing in swampy places south of San Claudio.

*D. PATENS* (Sw.) Ktze. A fern resembling *D. normalis* but having sharp pointed pinnules instead of blunt as in *D. normalis*. Found at Havana and Santiago at low altitudes.

D. MOLLIS (Jacq.) Hieron. Found growing along the trail at San Claudio.

NEPHROLEPIS BISERRATA (Sw.) Schott. I found one specimen growing on a palm stump at 1500 ft. altitude at San Claudio.

N. EXALTATA (L.) Schott. Growing in the dense jungle in the mountains west of Santiago at 2500 ft. altitude.

ASPLENIUM PUMILUM Sw. Found growing in shade on rocks at San Claudio.

A. CRISTATUM Lam. A very beautiful Asplenium with cut pinnules found in dense jungles on and near rocks west of Santiago at a high altitude.

A. SERRATUM L. A large leathery fern resembling *Polypodium phyllitidis*; growing on rocks at San Claudio.

A. HETEROCHROUM Kze. Growing on large rocks in shade at San Claudio.

A. DENTATUM L. A small fern growing in moist shade near San Claudio.

A. SALICIFOLIUM L. In rich dense woods on rocks at high altitudes west of Santiago.

CHEILANTHES MICROPHYLLA Sw. The only Cheilanthes I found in Cuba. It was found at Havana growing on limestone, also in a rocky dry valley 10 miles west of Santiago. I saw a few plants at Guanajay growing on the tile roofs of some of the houses where they were out of reach.

PITYROGRAMMA CALOMELAENA (L.) Link. Not plentiful, but occasionally met with near San Claudio. One plant was found at a low altitude near Santiago.

ODONTOSORIA WRIGHTIANA Maxon. A very beautiful climbing fern with very finely cut fronds three and four times pinnate. It resembles a very fine lace. Found growing on damp hillsides and in one instance in a valley climbing on bushes at San Claudio.

VITARIA FILIFOLIA Fée. I found only a few plants growing on the body of a live palm tree along the trail near San Claudio.

*DORYOPTERIS PEDATA* (L.) Fée. A fern commonly met with in shady woods on rocks, with a triangular deeply cut blade. San Claudio and Santiago.

*PTERIS LONGIFOLIA* L. Growing on rocks at Havana and at several places along the railroad between Havana and Guanajay.

*P. GRANDIFOLIA* L. I only found one small plant of this fern in the town of San Claudio, on a rocky cliff.

*PTERIDIUM CAUDATUM* (L.) Maxon. Growing along the trail near San Claudio.

*ADIANTUM CRISTATUM* L. Abundant both in Pinar del Rio Province and in Oriente Province. I found some specimens with sharp pinnules and some with truncate pinnules, although both were given the same name by Mr. Maxon.

*A. TRAPEZIFORME* L. The most beautiful maidenhair I found, having large delicate pinnules, some of them triangular in shape and two or three inches across. Some of the plants stood five feet high. Damp places, San Claudio.

*A. FRAGILE* Sw. A maidenhair which looked very much like *A. Capillus-Veneris*, growing in damp gullies. Some of the specimens had small wedge-shaped pinnules. All would lose their leaflets in pressing.

*A. MELANOLEUCUM* Willd. Abundant in shade on hillsides and ravines, San Claudio.

*A. CAPILLUS-VENERIS* L. Growing on limestone around Havana.

*A. VILLOSUM* L. A very coarse fern found south of San Claudio. Altitude 800 ft.

*A. PULVERULENTUM* L. A beautiful plant with curved pinnules found growing near San Claudio.

*A. TENERUM* Sw. Common around San Claudio.

*LYGODIUM CUBENSE* HBK. Found by the roadside trailing over bushes and even small trees around San Claudio.



*L. POLYMORPHUM* (Cav.) HBK. Trailing on bushes at the foot of the mountains near Santiago. All the fronds were sterile.

*ANEMIA PHYLLITIDIS* Sw. I found only one specimen growing on a rotten log south of San Claudio.

*A. ADIANTIFOLIA* Sw. One of the most abundant ferns found in Pinar del Rio Province and also found sparingly around Santiago. I found one specimen closely approaching *A. cuneata* Kze.

*BLECHNUM OCCIDENTALE* L. Along the trail south of San Claudio. Not abundant.

*ACROSTICHUM EXCELSUM* Maxon. Found in marshes around San Claudio. One colony covered perhaps an acre and stood six or eight feet high.

*TECTARIA MARTINICENSIS* (Spreng.) Copel. A large fern found at San Claudio growing in rich, shady ravines.

*T. HERACLEIFOLIA* (Willd.) Underw. Found in rocky woods near the trail south of San Claudio at 1000 ft. altitude.

STOCKPORT, IA.

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## Osmunda Claytoniana, forma Mackiana

E. M. KITTREDGE

Several years ago while driving near Bridgewater Corners, Vermont, Mrs. Mack of West Woodstock, Vt. noticed a colony of a dozen or more plants of a very curious *Osmunda* growing close to the road at the base of a steep hillside pasture. In the withered condition of the fronds it was not easy to say whether the plants were forms of *O. cinnamomea* or *O. Claytoniana*. The following year the plants were observed in fresh condition. *O. Claytoniana* was seen to be growing in great abundance and luxuriance a few rods away, the normal plants fruiting abundantly, but no fertile fronds appearing on the odd ones. The station was visited for several